DEPARTMENT OF TRANSPORTATION
U. S. COAST GUARD
CG-4006 (REV. 8-79)

SMALL PASSENGER VESSEL STABILITY TEST PROCEDURE

(In accordance with 46 CFR 179.10-1)

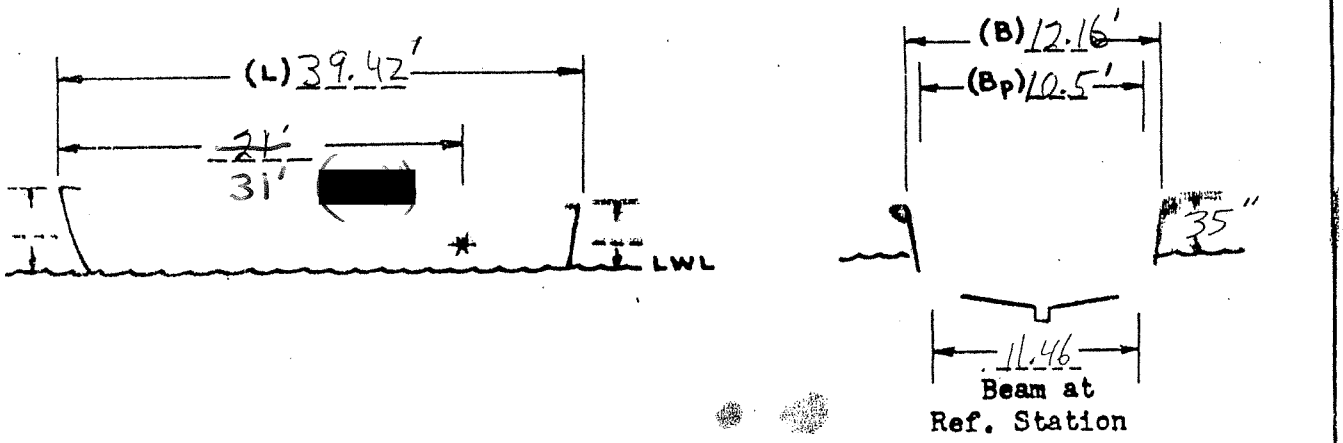
Name of Vessel Ethan Allan Official No. — Date 10-5-05

Representing ~~Owner~~ NTSB John Scarano Inspector Rob Henry

Location Lake George Wind: Relative Direction S Velocity 15 mph

Mooring arrangement, describe Dockside, slack

Route Lake George Check One ☐ Exposed ☐ Partially Protected ☑ Protected



Indicate on above sketch

1) Profile of sheer line
2) Length over all (L)
3) Station for measuring Reference Freeboard (f)...located in way of least freeboard or at a point 3/4 (L) from the stem if the least freeboard is aft of this point
4) Freeboard to main deck at stem
5) Freeboard to main deck at stern

Indicate on above sketch

1) Round or vee bottom
2) Maximum beam to outside of shell (B)
3) Max. beam accessible to passengers (B_p)
4) Max. beam on deck in way of Freeboard Reference Station.
5) Height of sheer line above load water line in way of Freeboard Ref. Station
6) Height of each deck (including cockpit deck, if any) above load waterline.

All above measurements are to be taken in the loaded condition without list
If cockpit type - show same by dotted line and indicate length ( )

TANKAGE (all tanks are to be 3/4 full at the time of the test)

TANK	CAPACITY	Approx. Location of C.G.	
		Aft of Stem	Above top of keel
Fuel	100 gal.	18.75'	18"

BALLAST (if provided, ballast must be on board and in place at time of test)

WEIGHT	MATERIAL	Approx. Location of C.G.	
		Aft of Stem	Above top of keel
1,123	Lead	21'	18"

(1) TOTAL TEST WEIGHT REQUIRED:

48 (Total No. Passengers) X 140 (Wt./Pass.) = 6,720 (Total Test Weight (W)) Lbs.

NOTES: (A) THE MAXIMUM NUMBER OF PASSENGERS SHALL EQUAL THE MINIMUM NUMBER COMPUTED IN ACCORDANCE WITH 46 CFR 176.01-25.

(B) WEIGHT PER PASSENGER EQUALS 160 POUNDS, EXCEPT THAT ON "PROTECTED WATERS" WHEN PASSENGER LOAD CONSISTS OF MEN, WOMEN AND CHILDREN; A WEIGHT OF 140 POUNDS PER PASSENGER MAY BE USED.

(C) IF NECESSARY, SHORE OR BRACE THE DECK STRUCTURE TO PROPERLY SUPPORT THE TEST WEIGHTS.

(2) DISTRIBUTION OF TEST WEIGHT:

(a) Distribute the test weight fore and aft so as to obtain the normal operating trim.

(b) Arrange test weight so that its C.G. is approximately 2.5 feet above deck.

(c) The vertical distribution of the test weight shall be such as to simulate the most unfavorable vertical C.G. likely to occur in service. On vessels having one upper deck above the main deck available to passengers, the distribution shall not be less severe than the following —

Total Test Weight (W)..... = 6,720

Pass. Capacity of Upper Deck per 46 CFR 176.01-25: 0 (No. Pass.) X ~~~~~ (Wt./Pass.) X 1.33 = 0 (Weight on Upper Deck) / 6,720 (Weight on Main Deck)

(3) LOCATION OF MARK FOR MAXIMUM ALLOWABLE IMMERSION ABOVE UPRIGHT LOAD WATERLINE

(h) = 17.16 Ft.

The freeboard measurement (h) shall be taken with the weight required in step (1) on board, apply (a), (b) or (c) according to type of vessel -or- (d) if that gives a lesser value for the height of the mark.

(a) Flush Deck Type Vessel (including well deck vessels where freeboard is measured to the weather deck) Freeboard (h) to lowest deck exposed to weather, must equal or exceed 10 inches. If less than 10 inches use 3(c), open-boat formula.

35 (Reference Freeboard (f)) ÷ 2 = 17.5 (Height of Mark (h) above L.W.L.)

(b) Cockpit Type Vessels
Freeboard to cockpit deck must equal or exceed 10 inches. If less than 10 inches use 3(c), open-boat formula.
Length over all.....(L) ----------
Length of cockpit...(l) ----------
Ref. Freeboard.....(f) ---------- (meas'd to gunwale)
Height of Mark.....(h) ---------- above L.W.L.
As per applicable formula →→→→→→→→→→→→

On Exposed Waters

$$h = \frac{f(2L - 1.5l)}{4L}$$

On Protected or Partially-protected Waters

$$h = \frac{f(2L - l)}{4L}$$

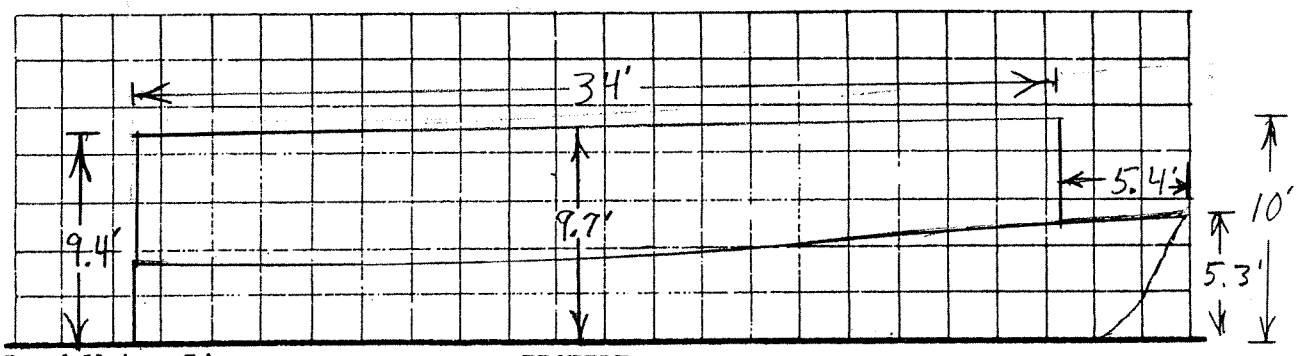
(c) Open-boat Type Vessels

_____ (Reference Freeboard (f)) ÷ 4 = _____ (Height of Mark (h) above L.W.L.)

(d) For All Types of Vessels
To limit the final angle of list to 14°, as required by 46 CFR 179.10-1(g), the height of the Mark (h) shall, in no case, exceed the following —

11.45 (Beam at Ref. Station) ÷ 8 = 1.43' = 17.16" (Max. (h) for any type vessel)

WIND HEEL CALCULATION
(Refer to Item 4b)



Load Water Line

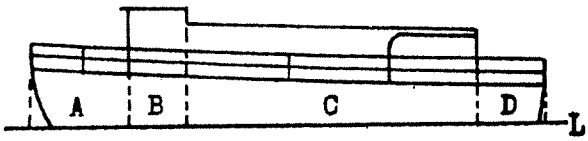
-PROFILE-
(SKETCH PROFILE IN ACCORDANCE WITH INSTRUCTIONS BELOW)

SECTION	L	V	A (L x V)	H (½ V)	A x H
A	5.4'	5.3'	28.6	2.65	75.8
B	34'	9.7'	~~34.3~~ 330	5.05	~~1599.5~~ 1665.5
				Sum (A x H)	~~1675.3~~ 1741.

Wind Heel (M_W): ~~1675.3~~ 1741 / Sum (A x H) X 7.5 / P = ~~12,562~~ 13,060 Ft. Lbs. [redacted]

INSTRUCTIONS

(1) Block off the profile of the vessel into rectangles, as shown below. Include passenger railings and structural canopies.



(2) Measure, on the vessel, the length (L) and the height (V) of each rectangle and enter in Table.
(3) Complete the Table as indicated, add the products in the last column and multiply this sum by the appropriate "P" value to obtain the Wind Heeling Moment (M_W). Check results on sheet 5.

Values of "P"	
Exposed Waters	15.0
Partially Protected Waters	10.0
Protected Waters	7.5

[redacted]

(4) REQUIRED HEELING MOMENT:
(Apply (a) or (b), whichever is greater

(a) Passenger Heeling Moment (M_p)

10.41 (Maximum Beam Accessible to Pass. (B_p)) X 6,720 (Total Test Weight (W)) ÷ 6 = 14,659 Ft.Lbs.

(b) Wind Heeling Moment (M_w) 13,060 [redacted] See sheet 4..... ~~14,565~~ Ft. Lbs.

(5) WEIGHT MOVEMENT:

(A) THE HEELING MOMENT REQUIRED BY ITEM (4) SHALL BE OBTAINED BY A TRANSVERSE MOVEMENT OF THE TEST WEIGHTS.
(B) THE TEST SHALL BE CONDUCTED WITH ALL PORTLIGHTS SECURED BUT WITH ANY NON-RETURN VALVES OR FLAPS ON SCUPPERS OR DECK DRAINS RESTRAINED IN THE OPEN POSITION.
(C) THE VESSEL IS TO BE FULLY AFLOAT AND ALL MOORING LINES ARE TO BE SLACK DURING THE TEST.
(D) DURING LOADING AND MOVING OF TEST WEIGHTS, CARE SHOULD BE TAKEN IF THERE IS EVIDENCE OF LOW STABILITY. THIS MAY BE TAKEN TO BE THE CASE WHENEVER THE EFFECT OF ANY ADDED OR SHIFTED WEIGHT INCREMENT IS NOTED TO BE MORE THAN THAT OF A PRECEDING INCREMENT OF THE SAME SIZE, OR WHEN THE CHINE OR BILGE AMIDSHIPS COMES APPRECIABLY OUT OF THE WATER AS A RESULT OF THE HEEL.
(E) CARE IS TO BE EXERCISED THAT THE VESSEL IS NOT LISTED EXCESSIVELY EITHER DUE TO WEIGHT MOVEMENT OR SUPERIMPOSED ROLL WHICH COULD CAUSE THE TEST WEIGHTS TO TOPPLE OR SHIPS GEAR TO COME ADRIFT.
(F) WHILE THE VESSEL IS LISTED, CHECK FOR OPEN SEAMS, LOOSE HULL FITTINGS, ETC., WHICH ARE NOT NORMALLY IMMERSED AND WHICH COULD CAUSE FLOODING OF THE VESSEL.

QUANTITY	WEIGHT PER UNIT-LBS.	DISTANCE MOVED-FT.	MOMENT - FT. LBS.
(4)	Blocking + H_2O Drums (= 535 lbs. x 4 = 2140)	0'	0
(4)	Blocking + H_2O Drums (= 535 lbs. x 4 = 2,140)	1.94'	4,152
(4)	Block + H_2O Drums (= 535 lbs. x 4 = 2,140)	3.94'	8,432
		TOTAL HEELING MOMENT	12,584

(6) HEIGHT OF REFERENCE MARK ABOVE WATERLINE AFTER WEIGHT MOVEMENT: Stopped test at 3"

Height of Mark (h) Above Waterline = ~~4~~ Ft.

(a) If the vessel lists to the reference mark (h) before the full heeling moment is applied, the test shall be stopped and the vessel fails the test.
(b) If any portlights are found to be at or near the waterline at the final angle of list, such portlights on each side shall be permanently closed.
(c) If any scuppers or drains are found to be below the waterline at the final angle of list so as to permit the entry of water into the hull or onto the deck, such openings on each side shall be provided with auto[redacted] return valves.

Simplified Stability Test
de Champlain

10-5-05 Test terminated after following weight movements.

Blocks	4'	× 60#	× 4'	= 960.	
Blocks	4'	× 60#	× 2'	= 480	
Drums + water	4'	× 477	× 3	= ~~4824.~~	5,724 ft · lbs
				~~6264.~~	
				~~6264~~	7,164 ft · lbs

[redacted]

[redacted]